ANALYSIS AND ATMOSPHERIC FATE OF METHYL BROMIDE USED AS A SOIL FUMIGANT

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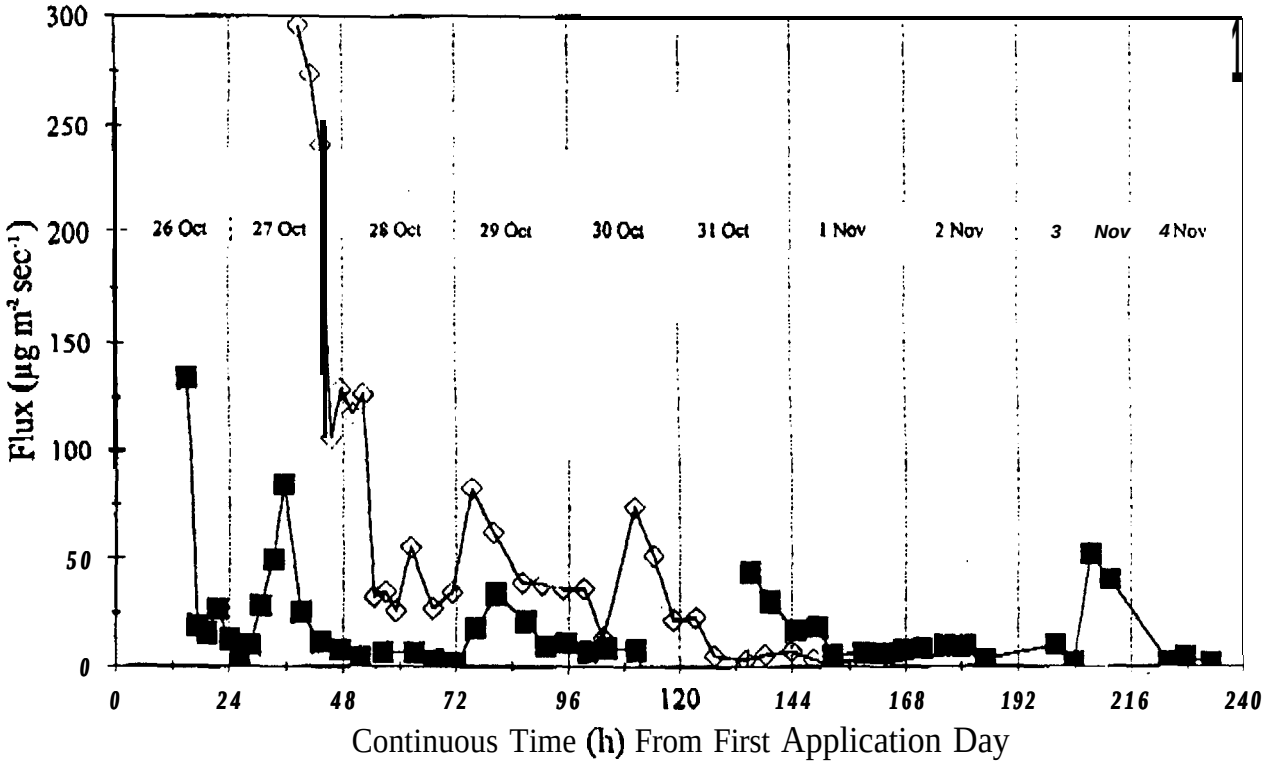
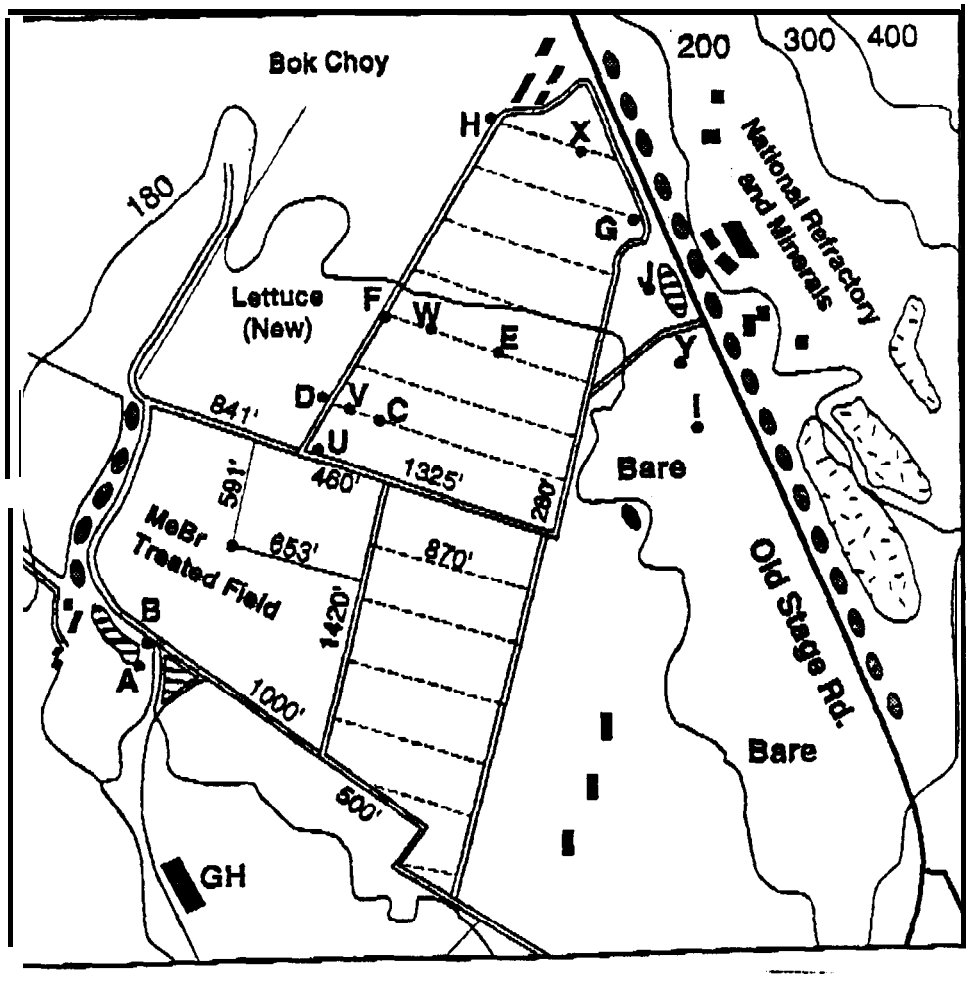
Work supported by USDA-CSRS, Western Region Pesticide Impact Assessment Program
and
California Strawberry Research Advisory Board

Methyl bromide volatilization fluxes were simultaneously measured from two agricultural fields under different application regimes. The fields were located approximately 6 km apart in Monterey County, California, and were treated in conformity with local practices as of 1992. One field was simultaneously covered with a high-barrier plastic film tarp during the application, and the other was left uncovered, but the furrows made by the injection shanks were bedded over. The methyl bromide was injected at a depth of 25 to 30 cm, Volatilization fluxes were estimated using an aerodynamic-gradient technique immediately following the completion of the application process and continued for 9 days for the tarped field and 6 days for the untarped field. The cumulative volatilization losses from the tarped field was 23 percent of the nominal application within the first 5 days of the experiment and 36 percent of the nominal application within 9 days. In contrast, the untarped field lost 98 percent of the nominal application by volatilization in 5 days.

From August 1 l-18, 1994, the University of Nevada, Reno, conducted a methyl bromide volatilization and fate study in Monterey County, California. Air concentrations of methyl bromide were measured above a fumigated field and downwind from the field with the objective of comparing vertical flux to horizontal flux using the methyl bromide concentration and meteorological data collected. Another objective was to compare long-range concentration data to concentrations predicted by a dispersion model (e.g., the Industrial Source Complex model) to begin the process of identifying potential methyl bromide sinks. The flux values, collected at four different locations from the center of the treated field to nearly one-half mild downwind, will serve as source terms for the model. The final objective of the study was to determine the lower limit of detection of a modified analytical method for airborne methyl bromide using field samples representing a wide range of concentrations.



Methyl bromide volatilization fluxes per period from the tarped (■) and untarped (◇) fields. Methyl bromide was applied to the untarped field approximately 24 hours after the tarped field application.



Detail map showing dimensions of treated field, surrounding terrain, and location of the upwind and downwind sampling towers for the August, 1994, test.